



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/730,855	12/08/2003	Soon-Yong Kweon	51876P422	6426
8791	7590	12/02/2004	EXAMINER	
BLAKELY SOKOLOFF TAYLOR & ZAFMAN 12400 WILSHIRE BOULEVARD SEVENTH FLOOR LOS ANGELES, CA 90025-1030			VU, HUNG K	
			ART UNIT	PAPER NUMBER
			2811	

DATE MAILED: 12/02/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/730,855	KWEON, SOON-YONG	
	<b>Examiner</b>	<b>Art Unit</b>	
	Hung Vu	2811	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 23 August 2004.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-49 is/are pending in the application.
- 4a) Of the above claim(s) 18-49 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-5, 7 and 11-17 is/are rejected.
- 7) ☒ Claim(s) 6 and 8-10 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)               | Paper No(s)/Mail Date. _____  |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>12/08/03</u> .  | 6) <input type="checkbox"/> Other: _____                                    |

## **DETAILED ACTION**

### ***Election/Restrictions***

1. Applicant's election of Invention of Group I, Claims 1-17, in the reply filed on 09/07/04 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

Applicant's election without traverse of Invention of Group I, Claims 1-17, in the reply filed on 09/07/04 is acknowledged.

Claims 18-49 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected Invention, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 09/07/04.

### ***Specification***

2. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

### ***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Art Unit: 2811

Claims 1 and 7 are rejected under 35 U.S.C. 102(b) as being anticipated by Kato et al. (PN 6,326,216).

Kato et al. discloses, as shown in Figure , a ferroelectric random access memory (FeRAM) capacitor comprising:

an active matrix including a semiconductor substrate (1), field oxide regions (3), a source/drain region (8), a first interlayer dielectric (ILD) (19) and a storage node contact (21);

a capacitor stack including a bottom electrode (23), a ferroelectric layer (24) and a top electrode (25), wherein the bottom electrode, the ferroelectric layer and the top electrode are formed on the active matrix and a width of the capacitor stack is relatively larger than that of the storage node;

a second ILD (28) enclosing capacitor stack, wherein the top face of the top electrode is not covered with the second ILD;

a plate line (26) formed on the top face of the top electrode and predetermined portions of the second ILD, the width of the plate line being larger than that of the top electrode.

With regard to claim 7, Kato et al. disclose the second ILD uses a material selected from the group consisting of PSG, SOG, USG and TEOS.

### ***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

Art Unit: 2811

having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2 – 5 and 11 – 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kato et al. (PN 6,326,216) in view of Bailey (P 6,249,014).

Kato et al. discloses the claimed invention including the capacitor as recited in the rejection above. Kato et al. further disclose a first glue layer formed between the first ILD and the bottom electrode. Kato et al. does not disclose a second glue layer formed between the second ILD and the plate line. However, Bailey discloses a second glue layer (TiN) formed between the second ILD and a plate line (1192). Note Figures 7B, 8B, 9B and 10B of Bailey. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to form the capacitor of Kato et al. having a second glue layer formed between the second ILD and the plate line, such as taught by Bailey in order to provide better adhesion between the second ILD and the plate line.

With regard to claim 3, Kato et al. and Bailey disclose all of the claimed limitations except material of glue layers. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to form the glue layers of Kato et al. and Bailey having the materials as that claimed by Applicant, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416.

With regard to claims 4, 11, 13, 15 and 17, the term “formed by using a method selected from the group ... (PVD)”, “formed by using ... (PEALD)” and “by using a method ALD” are method recitations in a device claimed. Note that only the final product is relevant, not the

method of making. A product by process claim is directed to the product per se, no matter how actually made. See also MPEP 2113. Moreover, an old or obvious product produced by a new method is not a patentable product, whether claimed in "product by process" claims or not.

With regard to claims 5, 13, 15 and 17, although Kato et al. and Bailey do not teach the thickness of the glue layers, the ferroelectric layer, the top electrode and the plate line, as that claimed by Applicants, however, it would have been obvious to one having ordinary skill in the art at the time the invention was made to form the glue layers, the ferroelectric layer, the top electrode and the plate line having a desired thickness, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

With regard to claim 12, Kato et al. and Bailey disclose the bottom electrode employs a material selected from the group consisting of Pt, Ir, Ru, Re, Rh and a combination thereof.

#### ***Allowable Subject Matter***

5. Claims 6 and 8-10 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

6. The following is an examiner's statement of reasons for allowance:

Applicant's claims 6 and 8-10 are allowable over the references of record because none of these references disclose or can be combined to yield the claimed FeRAM capacitor

Art Unit: 2811

comprising a top electrode having the top face is lower than the top face of the second ILD, as recited in claim 6; the second ILD is a double layer in which a first layer is formed on the first ILD and sidewalls of the capacitor stack for preventing oxygen diffusion and a second layer is formed on the first layer, as recited in claim 8.

***Conclusion***

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hung K. Vu whose telephone number is (703) 308-4079. The examiner can normally be reached on Mon-Thurs 6:00-3:30, alternate Friday 7:00-3:30, Eastern Time.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie C. Lee can be reached on (703) 308-1690. The Central Fax Number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Vu

November 17, 2003

A handwritten signature in cursive script, appearing to read "Hung Vu", is written over a horizontal line.

Hung Vu

Patent Examiner